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EXAMINER

AFREMOVA, VERA

ART UNIT PAPER NUMBER

1651

DATE MAILED: 02/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/826,393

Applicant(s)
Florin et al.

Examiner
Vera Afremova

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1651



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jun 6, 2001
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 1 20) ☐ Other: _____

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DETAILED ACTION

Claims 1-13 are pending and under examination.

Claim Objections

Claims 7 and 8 are objected to because of the following informalities: The Latin names of plants should be italicized. Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 11 and 12 are indefinite because it is uncertain what are the differences between active steps as claimed. For example: what temperatures and/or protocols are intended for “pre-freezing” and “cryo-freezing” step (claim 1)? Is a temperature controlled process intended for cryopreservation? The claimed invention is particularly uncertain as related to the concept of pre-treatment or with regard to the steps preceding cryopreservation or cryo-freezing. For example: what is the difference between “dehydrating” step and “pre-freezing” step (claim 1)? It is not clear whether dehydrating step is intended as drying step (meaning reduction of water/moisture contents) because the dehydration step of claim 11 is directed to incubation in various media and, thus, this step appears to be a culturing step rather than a drying step. Further, the process of claim 12 appears to be more confusing because it is directed to some additional steps prior to dehydration step but it is not certain whether these extra-steps are further limited to some

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additional pre-culturing steps or to actual drying/reducing water contents. Moreover, claim 1 is indefinite with regard to “an induction treatment for regeneration” because it is unclear as claimed what is intended.

Thus, the claimed process is indefinite because it is unclear as claimed what active steps are intended, how much active steps are intended and what is the sequence of the active steps which are intended for the claimed invention. It is also uncertain what is the plant material or tissue which is intended for whole process of the cryo-preservation and/or which is intended at the beginning of the process. Is there a difference between plant material subjected to “induction treatment” (claim 1) and subjected to pretreatment in a culture medium (claim 12)?

Claims 2-4 and 7-10 are indefinite because it is uncertain what plants selected from coffee, cacao and carrot plants are intended as “orthodox”, “semi-recalcitrant” or “recalcitrant” species.

Claims 5 and 6 are uncertain in the lack of definitions for explants capable to regenerate “buds” or “embryos”. And, it is uncertain to what “induction treatment(s)” the claimed explants were subjected (claim 1) in order to render them capable to regenerate “buds” or “embryos” as required by the claimed invention.

Claims 9 and 10 are indefinite because they appear to extend rather than to limit the claimed invention because common names of any biological material are broader terms than those limited by Latin names and, thus, the claimed “cacao” and “carrots” are not necessarily limited to representatives belonging to *Theobroma cacao* and *Daucus carota*.

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Claims 11-13 are indefinite because it is not particularly clear as claimed whether the “use” of a particular sucrose concentration is intended for preparation of culture/treatment systems (for example: see the phrase “involves the use”) or the particular sucrose concentration is intended as a final concentration in the culture/treatment system applied to the plant tissue.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Hatanaka et al. [IDS-AP].

Claims are directed to a process for the cryopreservation of plant tissues or primary explants comprising preculturing, dehydrating and freezing the plant tissues or primary explants. Some claims are further drawn to the use of plant material derived from *Coffee canephora*, to the use of incubation media with increasing sucrose concentration or sucrose concentration 0.4 M and 1 M in the process for cryopreservation of plant tissues.

Hatanaka et al. [IDS-AP] discloses a process for the cryopreservation of plant tissues or primary explants such as somatic embryos derived from *Coffee canephora* wherein the method comprises step of preculturing plant material on media with increasing concentration of sucrose,

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step of dehydrating (drying) in medium comprising sucrose and step of cryo-freezing the plant material (abstract). The cited method involves that use of medium with sucrose concentration 1.0 M sucrose (page 48, last paragraph) and about 0.4 M (0.3 M and 5.0 M). Thus, the cited method appears to anticipate the presently claimed method because both methods are comprising the identical active steps of preculturing, dehydrating and freezing the identical plant material such as somatic embryos derived from *Coffea canephora*. Both methods encompass the use of substantially similar, if not identical concentration of sucrose, particularly in view that the cited reference clearly teaches the use of increasing sucrose concentration as required by the claimed invention (claim 12, for example) and the use of the medium with 1.0 M sucrose for at least some of the dehydration/pre-treating/pre-freezing steps.

Claims 1-7 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Lecouteux et al. [IDS-AQ].

Claims are directed to a process for the cryopreservation of plant tissues or primary explants comprising preculturing, dehydrating or pre-freezing and cryo-freezing the plant tissues or primary explants. Some claims are further drawn to the use of plant material derived from *Daucus carota* (carrots) and to the use of incubation media with increasing sucrose concentration in the process for cryopreservation of plant tissues.

Lecouteux et al. [IDS-AQ] disclose a process for the cryopreservation of plant tissues or primary explants such as somatic embryos derived from *Daucus carota* (carrots) wherein the

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method comprises step of preculturing the plant tissue in media with increasing concentration of sucrose including the use of medium with 0.4 M sucrose concentration and step of two stage freezing down to cryo-temperature by using the pretreatment medium with various/increasing concentration of sucrose (see abstract or page 320 at last paragraph or figure 1, for example). Thus, the cited method appears to anticipate the claimed method because both methods are comprising identical active steps of preculturing, dehydrating and freezing the identical plant material such as somatic embryos derived from *Daucus carota*. Both methods encompass the use of substantially similar, if not identical concentration of sucrose, particularly in view that the cited reference clearly teaches the use of increasing sucrose concentration during pre-culturing/pre-treating step and the use medium with 0.4 M sucrose as the sole cryoprotectant.

Claims 1-7, 9 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Pence et al. [U].

Claims are directed to a process for the cryopreservation of plant tissues or primary explants comprising preculturing, dehydrating and freezing the plant tissues or primary explants. Some claims are further drawn to the use of plant material derived from *Theobroma cacao*, to the use of incubation media with increasing sucrose concentration or sucrose concentration 0.4 M and 1 M in the process for cryopreservation of plant tissues.

Pence et al. [U] discloses a process for the cryopreservation of plant tissues or primary explants such as zygotic embryos derived from *Theobroma cacao* wherein the method comprises

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steps of preculturing plant material on media with increasing concentration of sucrose from 3% to 21% (abstract or page 145, col. 1, par. 3), dehydrating or slow freezing (abstract or page 144, col. 2, last par.) and cryo-freezing (freeze-drying) the plant material (abstract or page 145, col. 1, line 21). The cited method involves that use of medium with sucrose concentration 1.0 M sucrose (page 145, col. 1, line 4) and about 0.4 M (9% -15%, for example: page 145, col.1, par. 3). Thus, the cited method appears to anticipate the claimed method because both methods are comprising identical active steps of preculturing, pre-freezing and cryo-freezing the identical plant material such as zygotic embryos derived from *Theobroma cacao*. Both method encompass the use of substantially similar, if not identical concentration of sucrose in the whole process, particularly in view that the cited reference clearly teaches the use of increasing sucrose concentration at least during pre-culturing step and the use of the medium with 1.0 M sucrose for some of the dehydration/pre-treating/pre-freezing steps.

Claims are rejected under 35 U.S.C. 102(b) as being anticipated by Tessereau et al. [IDS-AR].

Claims are directed to a process for the cryopreservation of plant tissues or primary explants comprising preculturing, dehydrating and freezing the plant tissues or primary explants. Some claims are further drawn to the use of plant material derived from *Coffea canephora* or *Daucus carota* and/or to the use of media with increasing sucrose concentration.

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Tessereau et al. [IDS-AR] disclose a process for the cryopreservation of somatic embryos derived from *Coffee canephora* or *Daucus carota* wherein the method comprises steps of preculturing, dehydrating and freezing the plant material tissues involving the use of media with increasing sucrose concentration including medium with 0.4 M sucrose concentration (abstract or page 549, col. 2, line 3). Thus, the cited method appears to anticipate the claimed method because both methods are comprising identical active steps of preculturing, pre-freezing and cryo-freezing the identical plant material and the use of substantially similar, if not identical concentration of sucrose.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. [IDS-AP] taken with Tessereau et al. [IDS-AR], Pence et al. [U], Lecouteux et al. [IDS-AQ] and Abdelnour-Esquivel et al. [IDS-AO].

Claims are directed to a process for the cryopreservation of plant tissues or primary explants comprising preculturing, dehydrating and freezing the plant tissues or primary explants. Some claims are further drawn to the use of plant material derived from *Theobroma cacao*, *Coffee canephora*, *Coffee arabica* or *Daucus carota* and/or to the use of incubation media with

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increasing sucrose concentration or sucrose concentration 0.4 M and 1 M in the process for cryopreservation of plant tissues.

The cited references by Hatanaka et al. [IDS-AP], Tessereau et al. [IDS-AR], Pence et al. [U] and Lecouteux et al. [IDS-AQ] are relied upon as explained above for the disclosure of processes for the cryopreservation of primary explants derived from various plants by preculturing, dehydrating and freezing the plant material in media with various and/or increasing sucrose concentration including concentration 0.4 M and 1 M. The cited references teach the similar cryopreservation techniques as suitable for various plants. The cited references are lacking the particular disclosure related to cryopreservation of plant material derived from *Coffee arabica*.

The reference by Abdelnour-Esquivel et al. [IDS-AO] is relied upon for the disclosure of cryopreservation of plant material derived from *Coffee arabica*. The cited references also teaches successful cryopreservation of primary explants derived from other plants including *Coffee canephora*.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to apply the presently claimed protocol of pre-culturing, dehydrating and freezing plant tissues derived from various plant species with a reasonable expectation of success in cryopreservation of plant tissues derived from various plant species because the similar protocols and cryoprotective media have been demonstrated as suitable for storage and/cryopreservation of tissues of various plant species including that which are presently

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claimed. Thus, the claimed invention as a whole was clearly prima facie obvious, especially in the absence of evidence to the contrary.

The claimed subject matter fails to patentably distinguish over the state art as represented by the cited references. Therefore, the claims are properly rejected under 35 USC § 103.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Afremova whose telephone number is (703) 308-9351. The examiner can normally be reached on Monday to Friday from 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn, can be reached on (703) 308-4743. The fax phone number for this Group is (703) 308-4242.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Vera Afremova, Ph.D.

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February 5, 2002.

V.A.

SANDRA E. SAUCIER
PRIMARY EXAMINER

